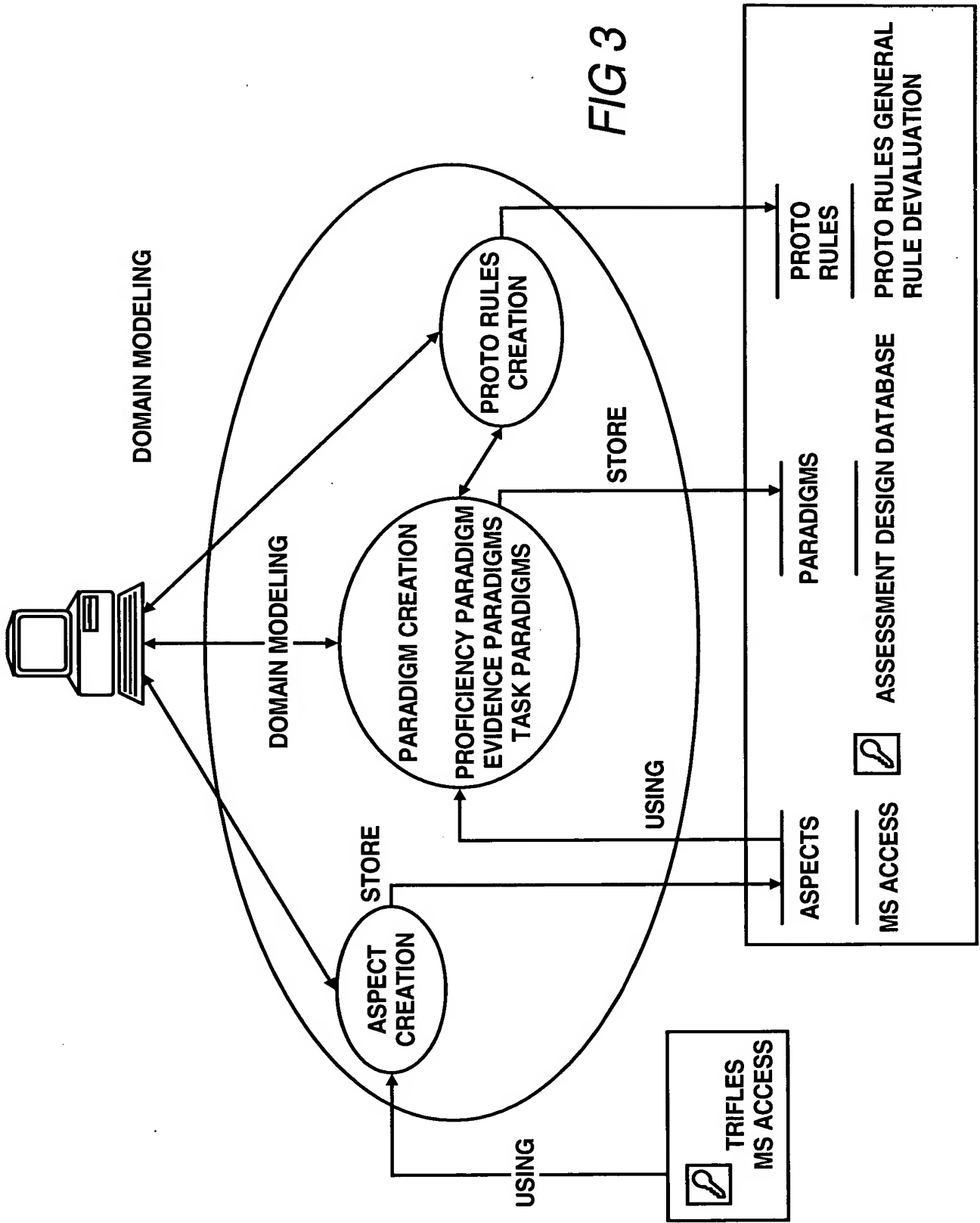


FIG 2
DOMAIN ANALYSIS



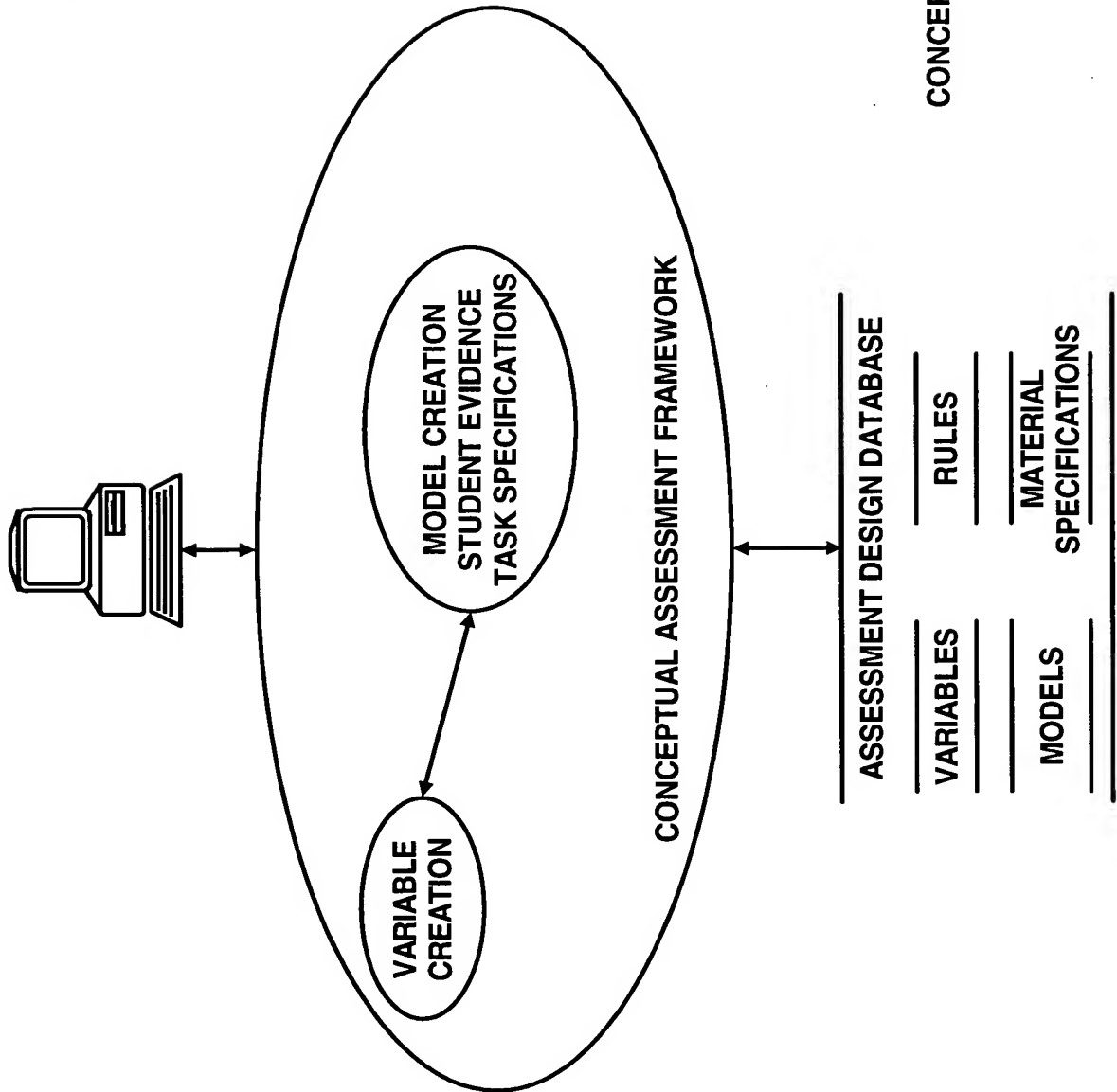
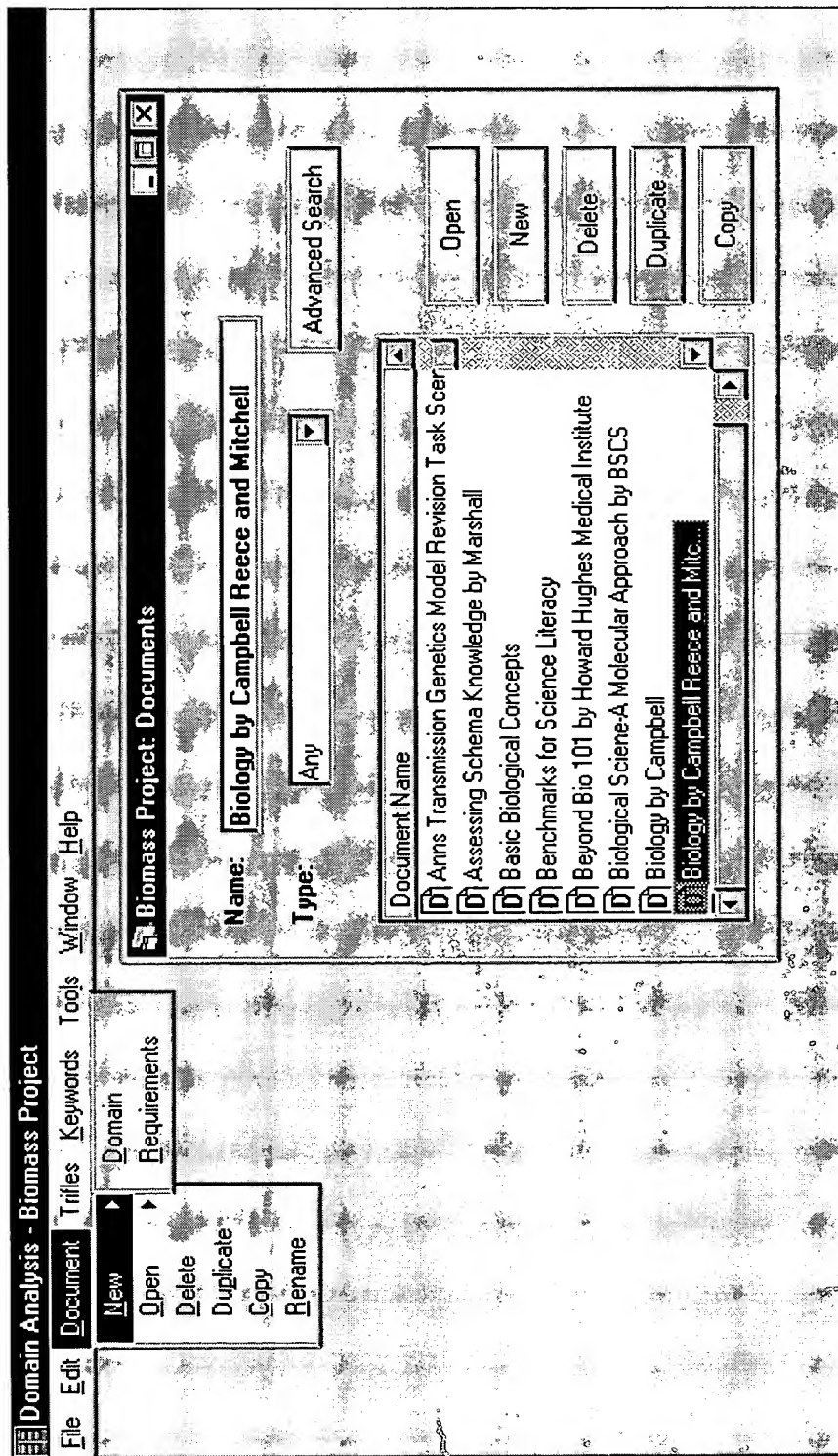


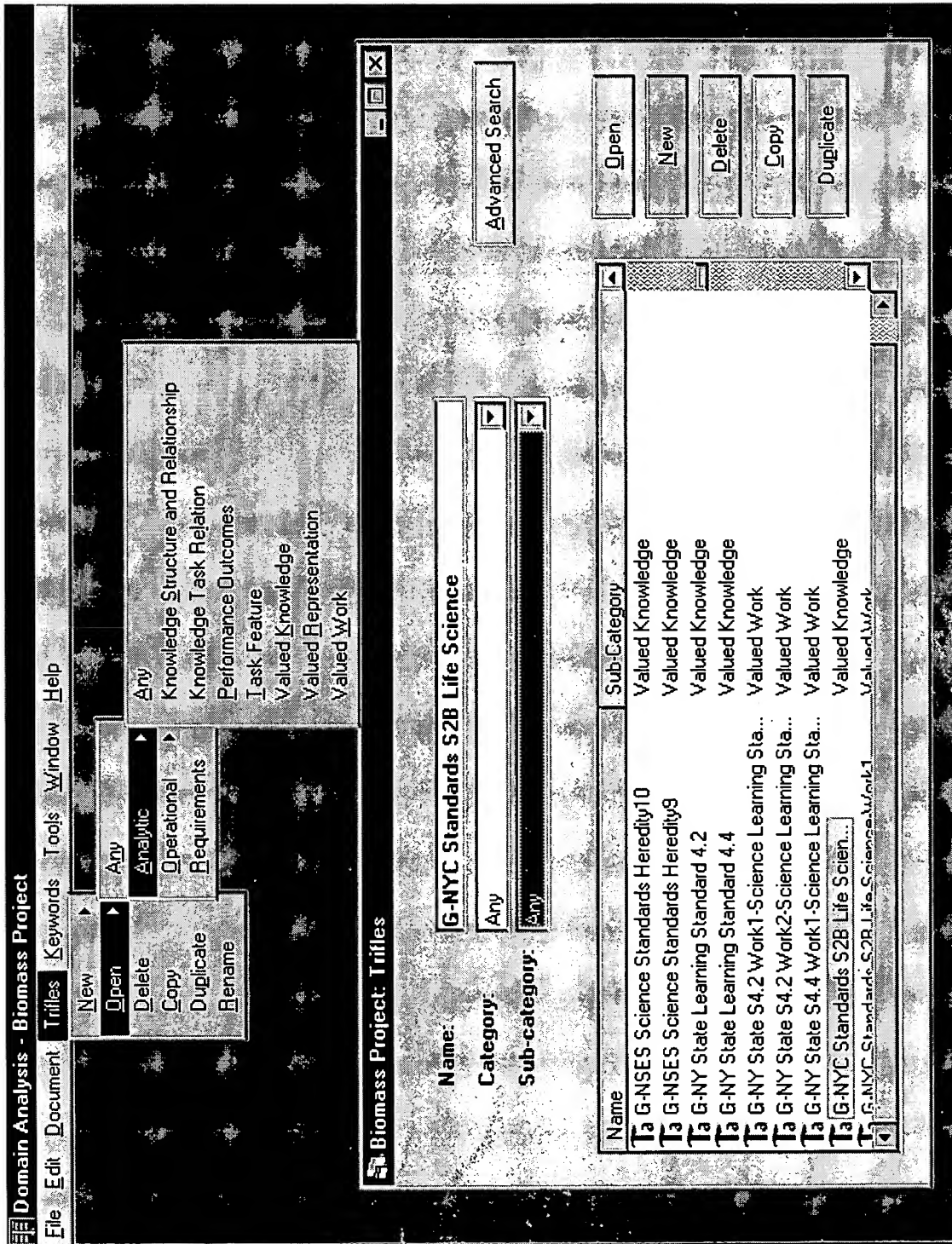
FIG 4

CONCEPTUAL ASSESSMENT FRAMEWORK



DOCUMENT MANAGEMENT FORM

FIG 5



TRIFLE MANAGEMENT FORM

FIG 6

New Presentation Paradigm

Name:

Description:

Tasks Properties Pedigree Hierarchies Notes

Presentation Note:

PRESENTATION PARADIGM

FIG 7

Domain Modeling - Biomass Project
File Edit Find Aspects Paradigms Proto Rules Keywords Tools Window Help

New Proto Rule

Name:

AP/Claim Add Remove Open

Relationship Choose

DPS Add Remove Open

Difficulty

Context effect

Related Proto Rules

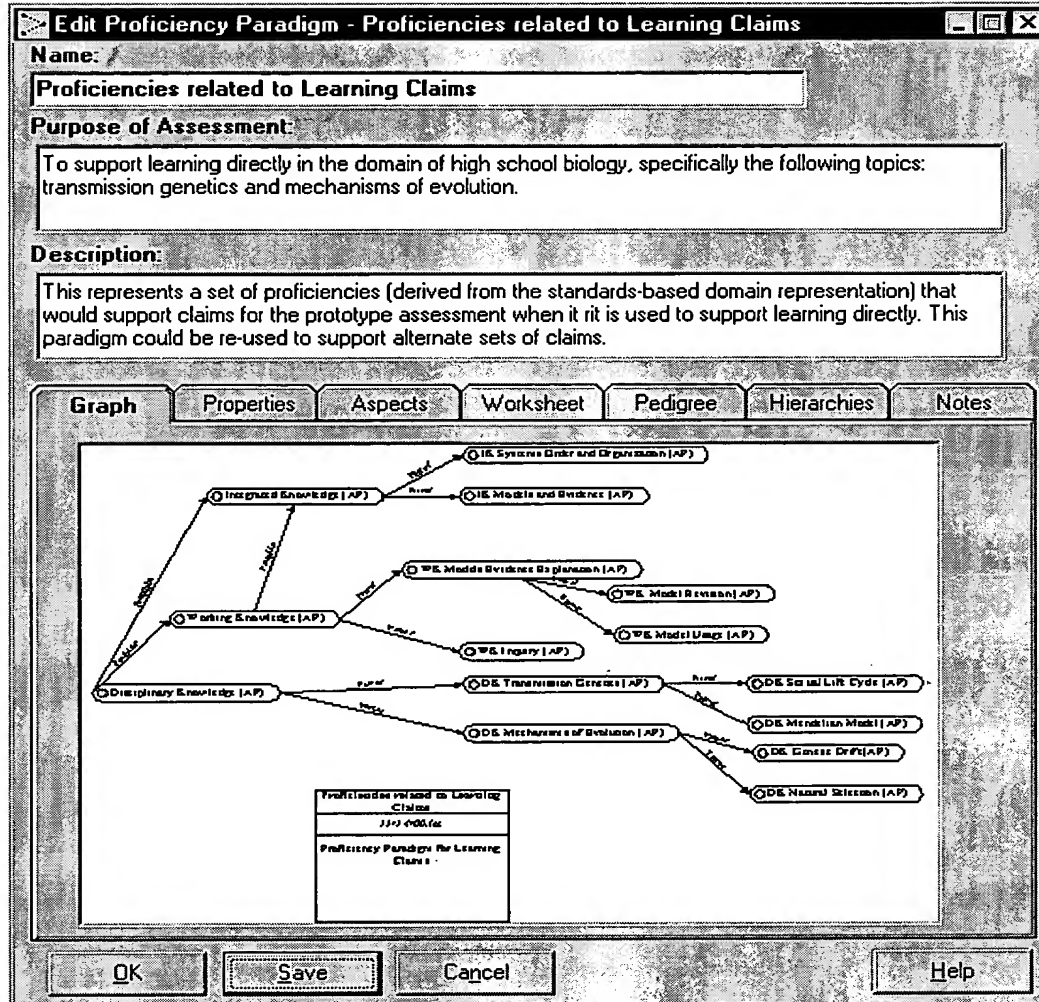
☐ Parsing ☐ Evaluation ☐ Interpretation

Add Remove Open

OK Apply Cancel

PROTO RULES

FIG 8



PROFICIENCY PARADIGM

FIG 9A

Edit Proficiency Paradigm

Name:
Proficiencies related to Learning Claims

Purpose of Assessment:
To support learning directly in the domain of high school biology, specifically the following topics: transmission genetics and mechanisms of evolution.

Description:
This represents a set of proficiencies (derived from the standards-based domain representation) that would support claims for the prototype assessment when it is used to support learning directly. This paradigm could be re-used to support alternate sets of claims.

Graph **Properties** **Aspects** **Scope** **Pedigree** **Hierarchies** **Notes**

Evidence Paradigms

- Agouti Segment 1 - Formalize Ho (Evid.
- Agouti Segment 10 - Cross Expertise (E
- Agouti Segment 11 - Punnett Sq (Evid.
- Agouti Segment 12 - Chi Sq (Evidence)
- Agouti Segment 13 - Ho Confirm/Disco
- Agouti Segment 14 - Ho Confirm/Disco
- Agouti Segment 15 - Ho Confirm/Disco
- Agouti Segment 16 - Write Report (Evi.
- Agouti Segment 17 - Sexual Life Cycle
- Agouti Segment 2 - Verify Method (Evi.
- Agouti Segment 3 - Phenotypic Proport
- Agouti Segment 4 - Impasse (Evidence
- Agouti Segment 5 - ...
- Agouti Segment 6 - ...
- Agouti Segment 7 - ...
- Agouti Segment 8 - ...
- Agouti Segment 9 - ...

Worksheets

Open Add Remove Open

OK Save Cancel Help

PROFICIENCY PARADIGM

FIG 9B

Edit Aspect Of Proficiency

Name: DK Mendelian Model (AP)

Description:
This potential student model variable represents factual (declarative and procedural) knowledge of the Mendelian Model (absent its integration w/inquiry or unifying concepts).
Used in Reporting in assessment to support learning.

Properties **Pedigree** **Hierarchies** **Notes**

I Belong To:

- DK Transmission Genetics (AP)

Belongs To Me:

Add... Remove Open... Add... Remove Open...

OK Save Cancel Help

AN EXAMPLE OF AN ASPECT OF PROFICIENCY

FIG 9C

Edit Descriptor Of Performance Outcomes And Behavior

Name: **Data Organization - Scoring Obs**

Description:
This describes possible outcomes for organizing data so that it can be interpreted.

Properties | Pedigree | Hierarchies | Notes

Possible Values:
Add
Effective data organization
Somewhat effective data organization
Ineffective data organization

Keywords:
Add ... Remove

Roles:
☒ Observable
☐ Consolidation

OK Save Cancel Help

Edit Descriptor Of Performance Outcomes And Behavior

Name: **Data/Model Relationships - Scoring Obs**

Description:
This describes possible outcomes in relating patterns of data to particular models

Properties | Pedigree | Hierarchies | Notes

Possible Values:
Add
Data and model(s) related appropriately
Data and model(s) related somewhat appropriately
Data and model(s) not related

Keywords:
Add ... Remove

Roles:
☒ Observable
☐ Consolidation

OK Save Cancel Help

EXAMPLES OF DESCRIPTORS OF PERFORMANCE OUTCOMES / BEHAVIORS

FIG 10

The screenshot shows a software window titled "Edit Proto Rule". At the top, there is a "Name:" field containing the text "Agouti Segment 1 Interpretation Rule". Below this, the window is divided into several sections:

- AP/Claim:** A text area containing "DK Mendelian Model (AP)". Below it are "Add", "Remove", and "Open" buttons.
- Relationship:** A text area containing the text: "Parents DKM and CONTEXT are modeled as compensatory over each of the 4 instances of MMRep and 3 instances of MMGen .".
- Difficulty:** A text area containing the text: "All observables are expected to be of typical difficulty, except the first Mendelian Model Representation one--it is expected to be easier than typical.".
- Related Proto Rules:** A section with three checkboxes labeled "Parsing", "Evaluation", and "Interpretation", all of which are currently unchecked. To the right of these checkboxes is a large empty text area. Below this area are "Add", "Remove", and "Open" buttons.
- AP/Claim (bottom left):** A text area that is currently empty. Below it are "Add", "Remove", and "Open" buttons.
- DPS:** A text area that is currently empty. Below it are "Add", "Remove", and "Open" buttons.
- DPO:** A text area containing two entries, each preceded by a downward-pointing triangle: "Mendelian Model Gener..." and "Mendelian Model Repre...". Below it are "Add", "Remove", and "Open" buttons.

At the bottom right of the window, there are three buttons: "OK", "Apply", and "Cancel".

AN EXAMPLE INTERPRETATION PROTO RULE

FIG 11

EXAMPLE ROLES OF DESCRIPTORS OF PERFORMANCE SITUATIONS IN A TASK PARADIGM

FIG 12

Edit Task Skeleton

Name: **Agouti Segment 1 - Formalize Ho (Task)TS1**

Paradigm Name: **Agouti Segment 1 - Formalize Ho (Task)**

Description: **This paradigm describes task segment 1 of the agouti mouse scenario. This segment is focused on knowledge related to the Mendelian Model and its representation, as well as investigative technique.**

Stimulus **Response** **Scope** **Properties** **Pedigree** **Notes**

KR

Add ... **Remove** **Open...**

MOI Standard Text Form
MOI Symbol Tool Box
Population Attribute Table
Population Summary Cr...
Text Prompt(s)

Stimulus Notes

The primary stimulus material for this task is the Population Summary Cross Table. In this version it contains Jose's original crosses and results.

Prompts are used for Disciplinary and Investigative Knowledge

DPS

Show Category: **All**

Open

View As:
☒ **Tree**
☐ **List**

Domain Topic Requirement * Transmission genetics
Knowledge Level * Working
Number of Genes Determining Characteristic of Interest * one
Organism * real mammal
Prototype Domain * biology
Transmission Genetics * mode of inheritance

Roles of Selected DPS:

OK **Save** **Cancel** **Help**

FIG 13

New Student Model Variable

Variable Name:

Description:

States | **Properties** | **Pedigree** | **Notes**

☐ **Ordered States**

State Details

State Name:

State Description:

☐ **True State**

STUDENT MODEL VARIABLE

FIG 14

New Evidence Model Variable

Variable Name: **Evidence Model Variable 185**

Description:

States | Properties | Pedigree | Notes

State Details:

State Name:

State Description:

☐ True State

☐ Ordered States

Add
Remove
Sort
↑ ↓

OK Save Cancel Help

EVIDENCE MODEL VARIABLE

FIG 15

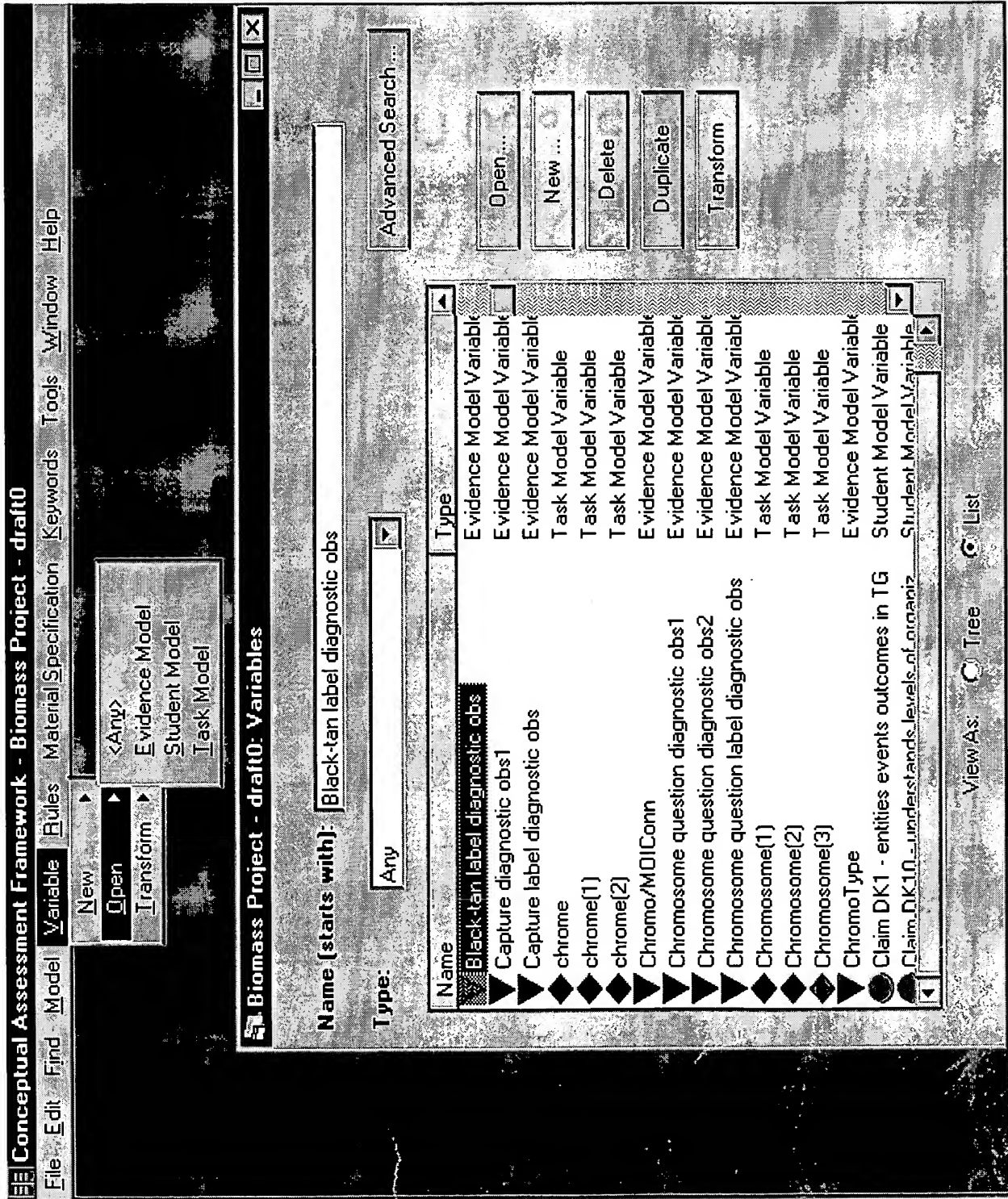


FIG 16

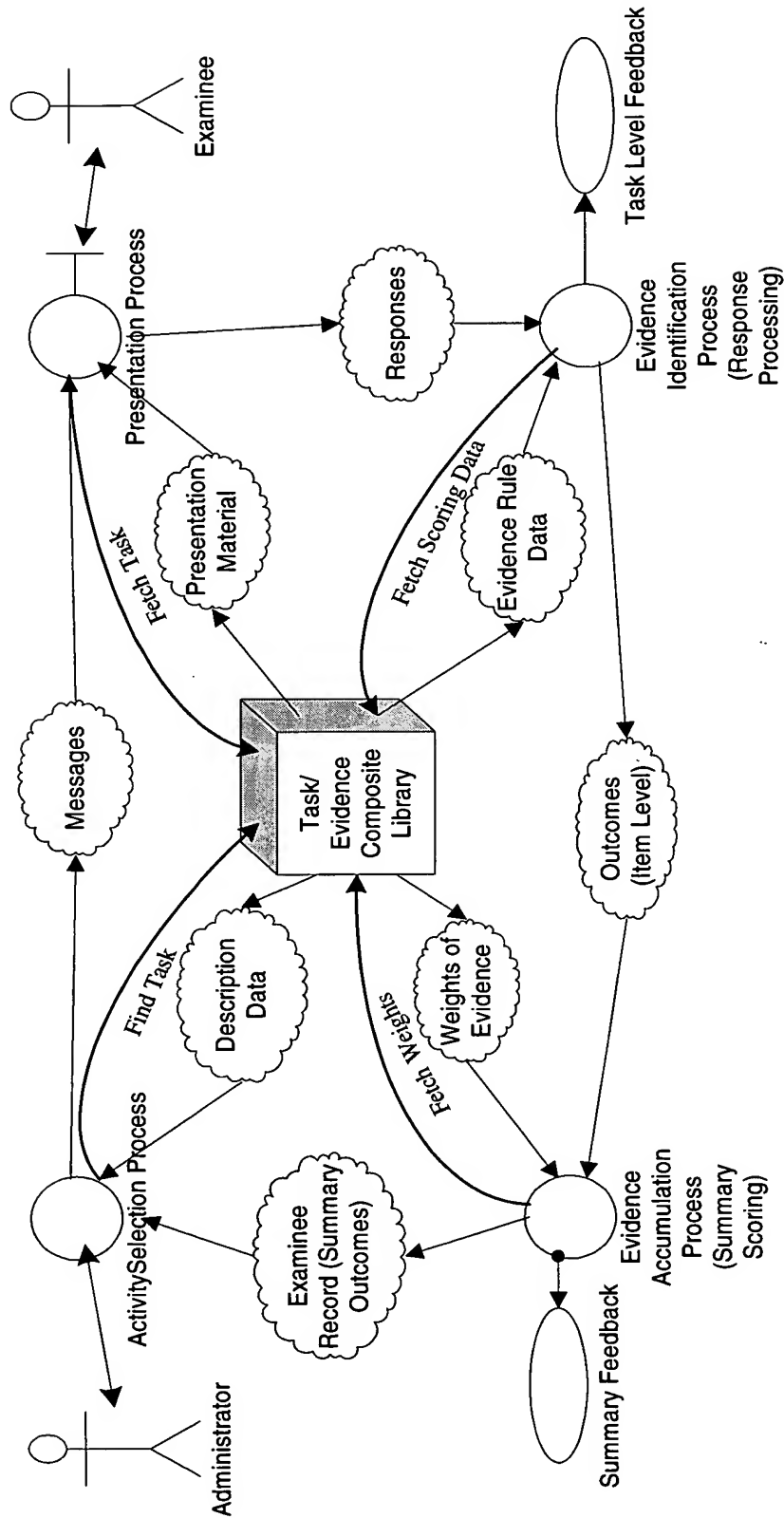
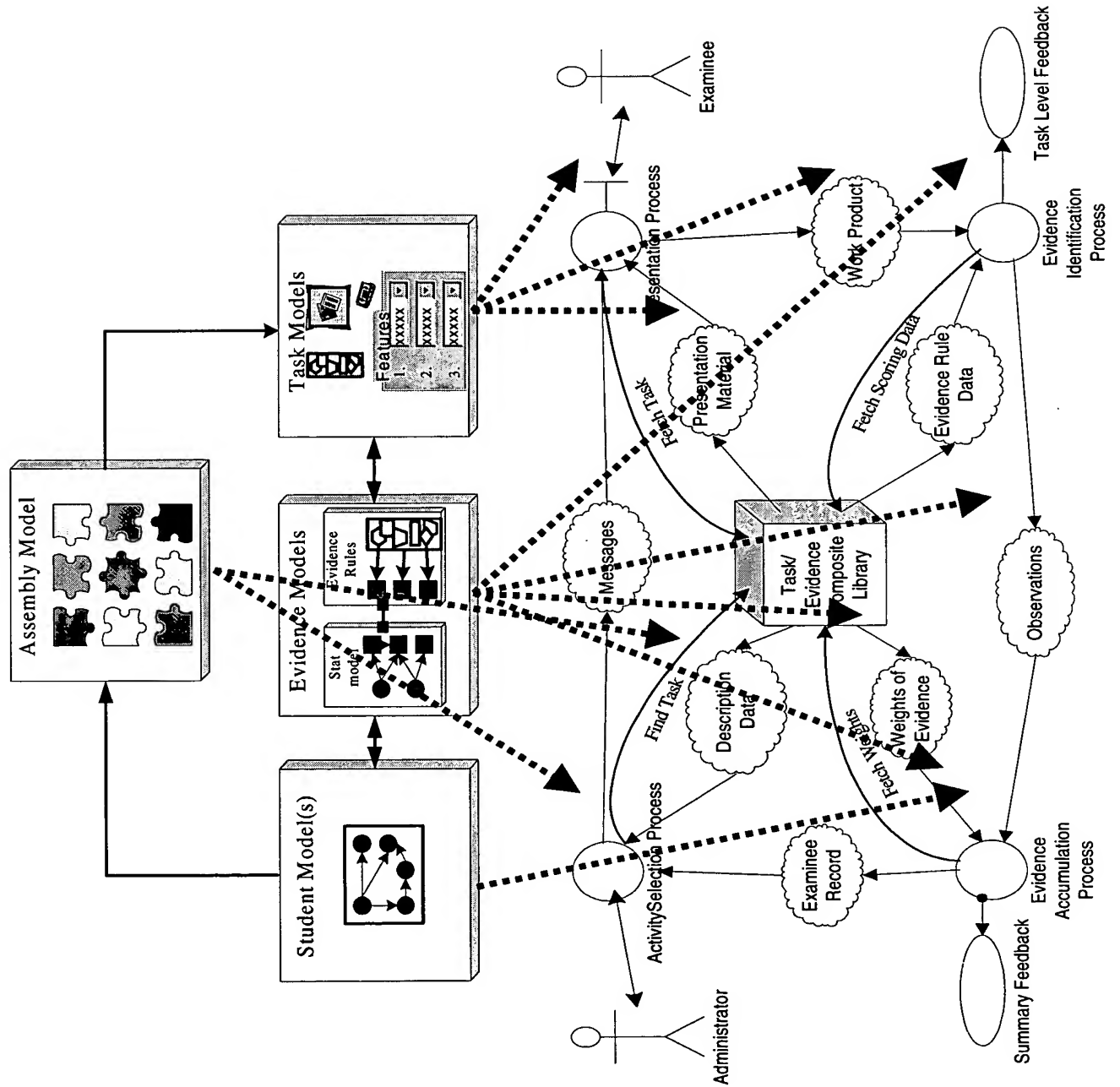


FIG 17

FIG 18



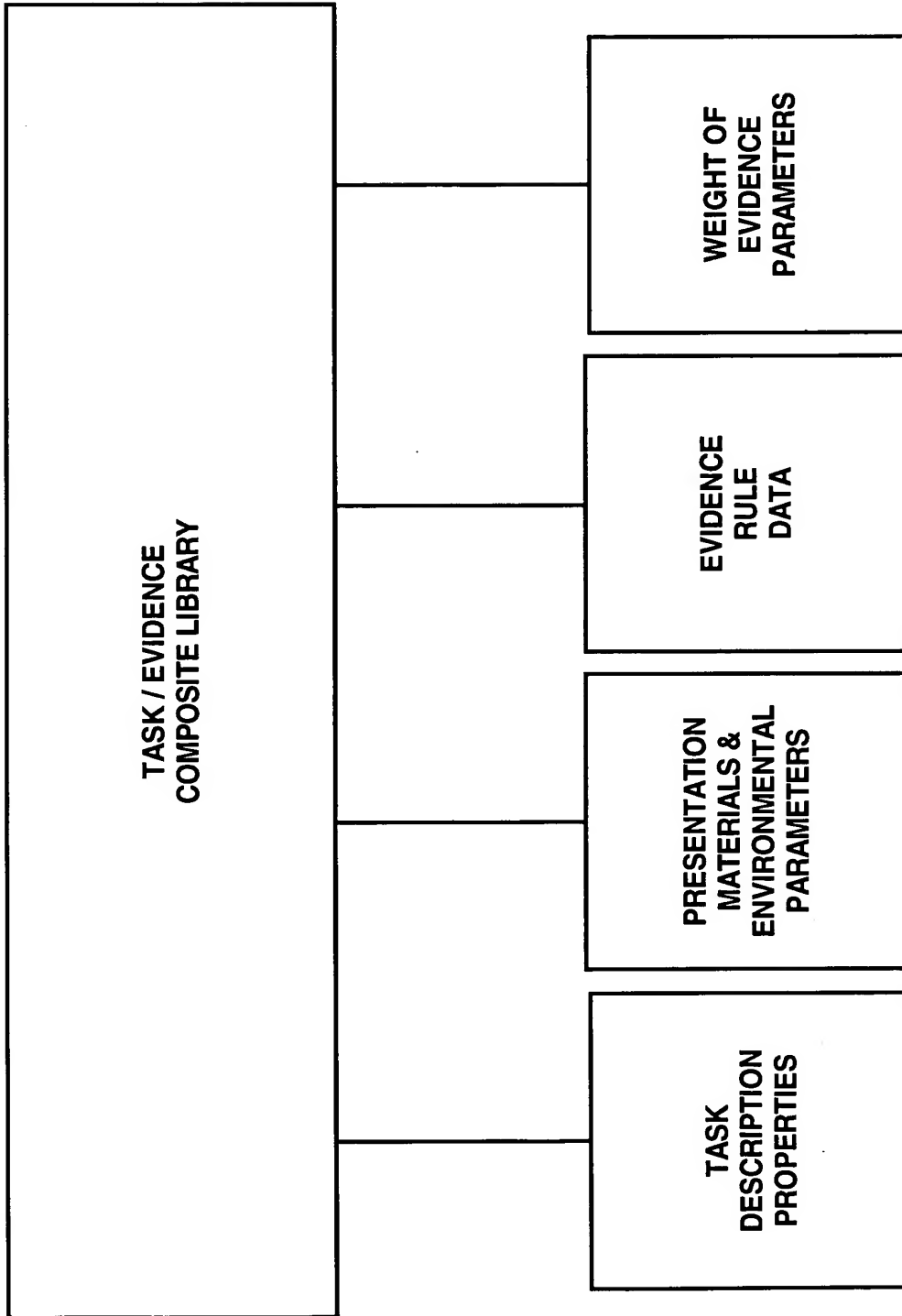


FIG 19

Student Model Variable

Variable Name: WKInqny

Description:
This potential student model variable represents the use of efficacious scientific methodology in formulating inquiries into transmission genetics and mechanisms of evolution.

States

High

Middle

Low

Add

Remove

Sort

Ordered States

Properties

State Name:

State Description:

True State

Pedigree

Notes

OK

Save

Cancel

Help

Edit Student Model Variable

Variable Name: JKMendel

Description:
This potential student model variable represents factual (declarative) knowledge of the Mendelian Model (absent its integration w/inquiry or unlying concepts).
Reporting: Interim + task-based feedback.

States

High

Middle

Low

Add

Remove

Sort

Ordered States

Properties

State Name:

State Description:

True State

Pedigree

Notes

OK

Save

Cancel

Help

EXAMPLE STUDENT MODEL VARIABLES WITH STATES

FIG 20

Reporting Rule

Rule Name: **Reporting for WK and Transmission Genetics**

Rule Type: **<unspecified>**

Description:

Specification **Pedigree** **Notes**

Instructions (human or computer):

Claims:

- ★ WK Claim 9

Input Variables:

- ☒ DK
- ☒ DKMendel
- ☒ DKTrnGen
- ☒ WKInqry
- ☒ WKModRev
- ☒ WKModUse

Output:

Reporting Name: **Sample Statistic**

Interpretation:

Score Ranges:
Probabilities at particular levels of proficiency, accompanied by **Score Interpretation Guide**.

Diagrams:

OK Save Cancel Help

AN EXAMPLE REPORTING RULE

FIG 21

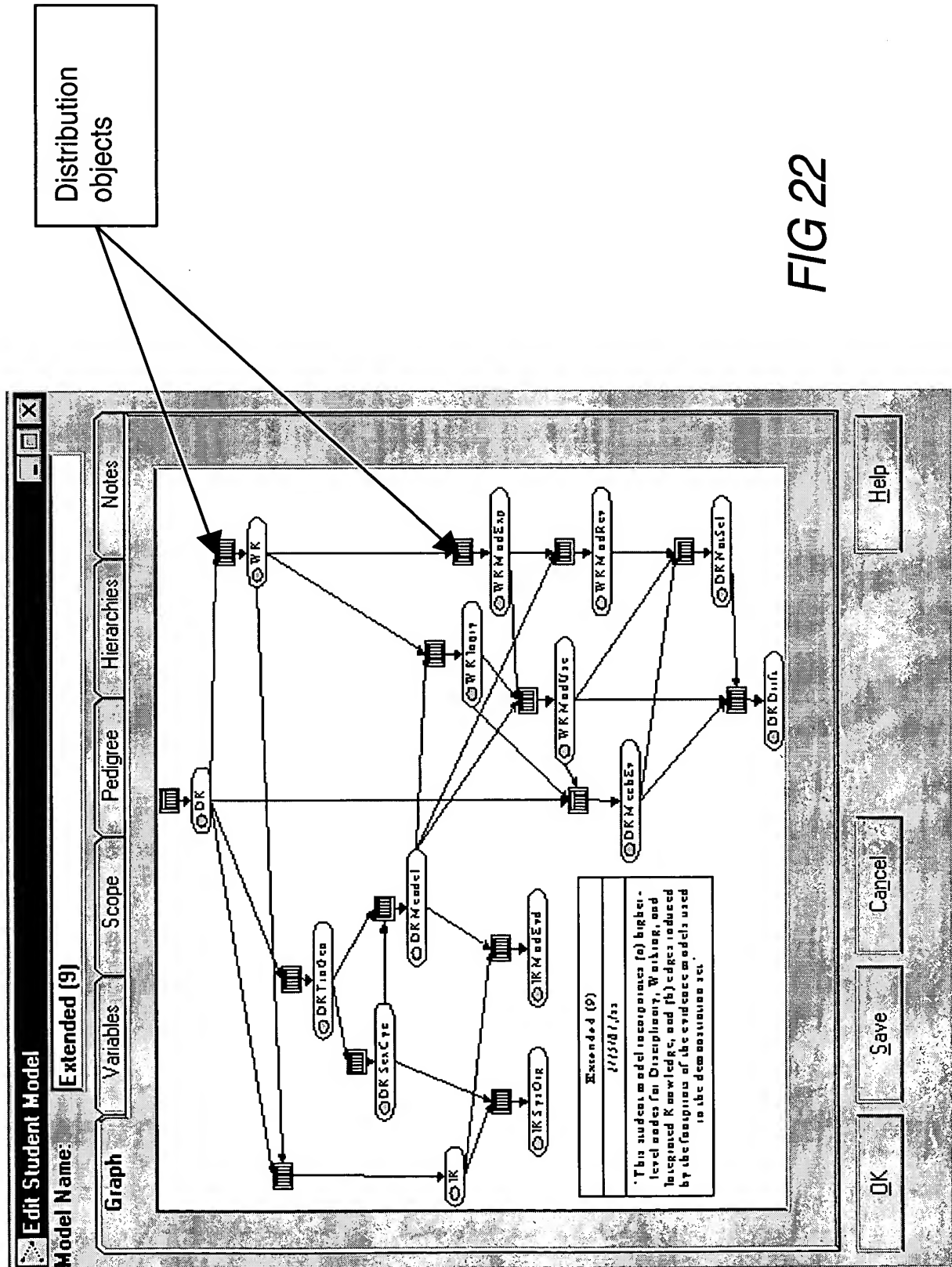


FIG 22

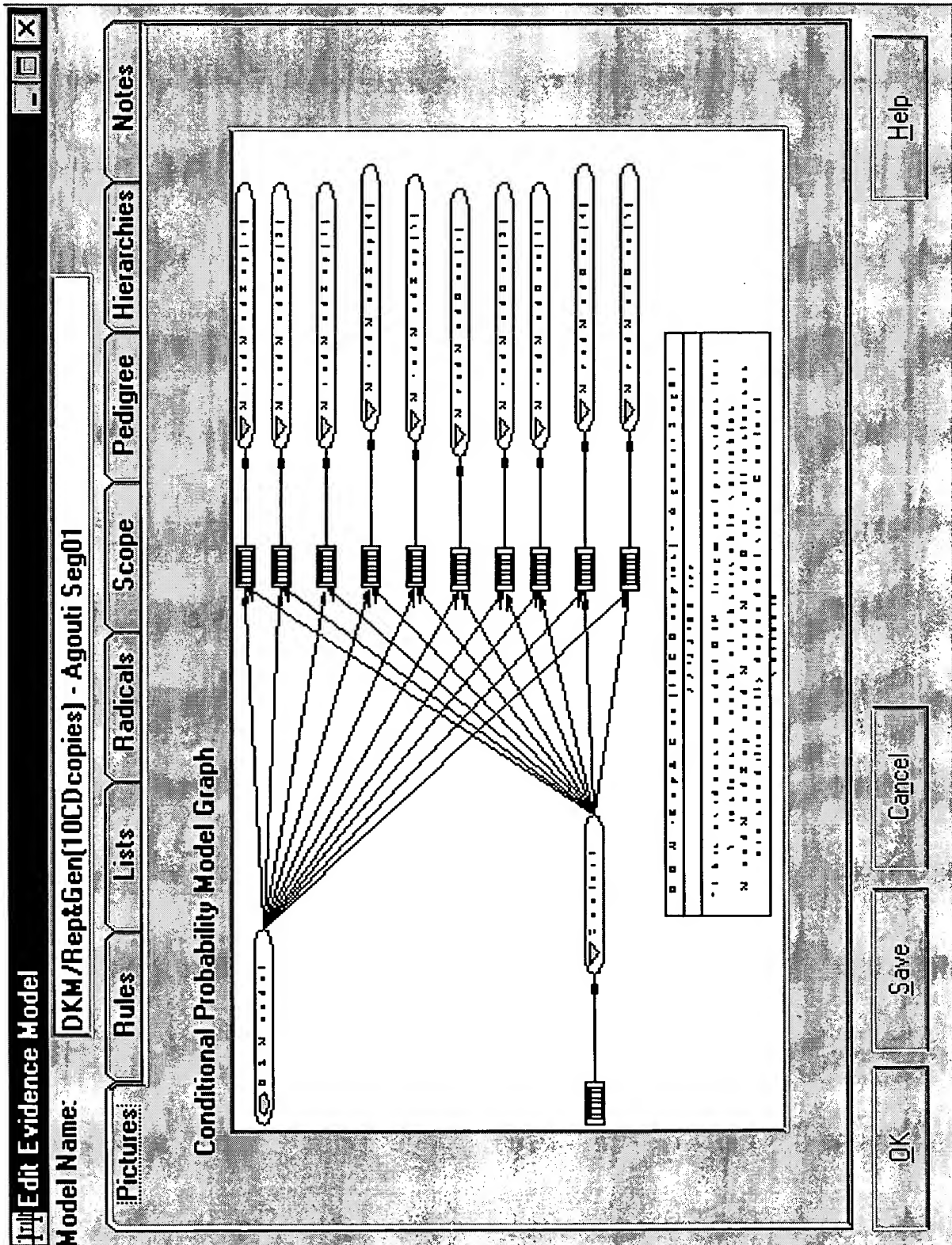


FIG 23